IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Kutsovsky

Application No. 10/720,582

Art Unit: 1793

Examiner: Wartalowicz, Paul A.

Filed: November 24, 2003

For: FUMED METAL OXIDE PARTICLES AND PROCESS FOR PRODUCING THE SAME

DECLARATION UNDER 37 C.F.R. § 1.132 OF YAKOV E. KUTSOVSKY

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Yakov E. Kutsovsky, hereby declare that:

1. I am an employee of Cabot Corporation and the inventor of the subject matter disclosed and claimed in the subject patent application.

2. I received my Masters of Science degree in Chemical Physics in 1989 from Novosibirsk State University, Russia, and my Ph.D. degree in Chemical Engineering in 1996 from the University of Minnesota. Prior to pursuing my doctoral degree, I worked for the Boreskov Institute of Catalysis in Russia on elementary reactions on catalyst surfaces. After obtaining my Ph.D. degree, I joined Cabot as an Engineering Associate in 1996. Since that time, I have held positions in process and product development in both Carbon Black Research and Development and Fumed Metal Oxides Research and Development. My current position at Cabot is Vice President of Research and Development.

3. Further details concerning my education and employment experience are set forth in my Curriculum Vitae, a copy of which is attached hereto.

4. As a result of my education and employment experience, I am knowledgeable about production processes for the preparation of a variety of particles, including, but not limited to, carbon black particles and fumed metal oxide particles.

5. I understand that several references have been cited by the Examiner at the U.S. Patent and Trademark Office during the prosecution of the subject patent application, including U.S. Patent 5,340,560 (Rohr et al.), U.S. Patent 5,256,389 (Jordan et al.), U.S. Patent 6,312,656 (Blackwell et al.), and U.S. Patent 5,904,762 (Mahmud et al.). I have reviewed the aforementioned references.

6. While the Rohr '560 patent relates to the preparation of fumed metal oxide particles, the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent do not relate to the preparation of fumed metal oxide particles. In particular, the Jordan '389 patent pertains to the preparation of a foamed particle. The Blackwell '656 patent pertains to the preparation of amorphous soot. The Mahmud '762 patent pertains to the preparation of a dual-phased carbon/silica particle.

7. The process parameters involved with the preparation of a foamed particle, amorphous soot, and dual-phased carbon/silica particles as disclosed in the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent, respectively, differ in significant respects from the process parameters involved with the preparation of fumed metal oxide particles as disclosed, for example, in the Rohr '560 patent. These process differences are so significant that those in the industry – at least prior to my invention – would not have reasonably considered using the process parameters disclosed in the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent to modify the process for preparing fumed metal oxide particles as disclosed in the Rohr '560 patent because those in the industry at that time would not have reasonably believed that the resulting process would have been able to successfully produce

fumed metal oxide particles. Indeed, I could find nothing in the Jordan '389 patent, the Blackwell '656 patent, and the Mahmud '762 patent that suggests that the injection of a liquid feedstock into the stream of combustion gas formed from the combustion of the oxidant and liquid or gaseous fuel, let alone as the stream of combustion gas flows through a constricted outlet portion of the reactor, as in my inventive process, could be carried out in the manner necessary to *both* atomize *and* combust or pyrolyze the liquid feedstock to successfully form fumed metal oxide particles.

8. I hereby declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: January 26 2009

Yakov E. Kutsovsky

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Yakov E. Kutsovsky

Education

1991-1996 **University of Minnesota**, Minneapolis, MN
Ph.D. in Chemical Engineering GPA: 4.0/4.0
Thesis: "NMR Imaging of Flow and Dispersion in Bead Packs"
Advisors: H.T. Davis, L.E. Scriven and B.E. Hammer

1982-1989 **Novosibirsk State University**, Novosibirsk, Russia
M.S. in Chemical Physics GPA: 5.0/5.0
Honors: Honor Diploma

Professional Experience

1996-Present Cabot Corporation
2005 - Global R&D Director
2003-2005 FMO R&D Director
2002-2003 FMO Process Development Manager
2000-2002 Research Project Leader, Rubber Blacks R&D and FMO R&D
1999- 2000 Senior Engineering Associate, Rubber Black R&D
1996-1998 Engineering Associate, Process Technology Group

1991-1996 Research Assistant, **University of Minnesota,** Minneapolis, MN
1989-1991 Researcher, **Institute of Catalysis**, Novosibirsk, Russia

Professional Memberships: AIChE, MRS and ACS

Awards

Cabot Corporation Bodman Excellence Award for CB Yield Improvement 2005
Cabot Corporation Bodman Excellence Award for 100% MTCS Technology Development 2005
Cabot Corporation Bodman Excellence Award for Fumed Metal Oxides Platform Development 2003
Outstanding Teaching Assistant Award (1994-1995)
Doctoral Dissertation Fellowship (1994-1995)
The First place at the USSR Student Scientific Works Competition (Novosibirsk, 1988)
State Fellowship in Science (1987-1989)- Highest Student Award in the USSR
Awarded Gold Medal in the High School (Overall GPA 5.0/5.0)

Publications

US 20050249657 Carbon black and multi-stage process for making same
US 20050238560 Fumed metal oxide particles and process for producing the same
US 20040156773 Fumed metal oxide particles and process for producing the same
US 20020183437 Method of making a multi-phase aggregate using a multi-stage process
US 20020161099 Method of making a multi-phase aggregate using a multi-stage process
US 20020027110 Polymers containing modified pigments and methods of preparing the same
US 2002000698 Polymers containing modified pigments and methods of preparing the same
US 6,709,506 Method of making a multi-phase aggregate using a multi-stage process
US 6,686,409 Method of making a multi-phase aggregate using a multi-stage process
US 6,534,569 Polymers containing modified pigments and methods of preparing the same
US 6,469,089 Elastomeric compounds with improved wet skid resistance and methods to improve wet skid resistance
US 6,364,944 Method of making a multi-phase aggregate using a multi-stage process
US 6,150,453 Elastomeric compounds incorporating metal-treated carbon blacks

Effect of surface area of fumed silica on silicone rubber reinforcement. Morris, Michael D.; Wang, Meng-Jiao; Kutsovsky, Yakov. Spring Technical Meeting - American Chemical Society, Rubber Division, 167th, San Antonio, TX, United States, May 16-18, 2005 (2005), 49/1-49/37.

Carbon Black. Wang, Meng-Jiao ; Gray, Charles A. ; Reznek, Steve A., Mahmud, Khaled ; Kutsovsky, Yakov Kirk-Othmer Encyclopedia of Chemical Technology (2005) Vol 4, pp. 761-803

A new generation carbon-silica dual phase filler (CSDPF) Part II. Application to passenger tread compounds for improved tradeoff among rolling resistance, wet traction and treadwear performance. Zhang, Ping; Wang, Meng-Jiao; Kutsovsky, Yakov; Laube, Stephen; Mahmud, Khaled. Rubber Expo 2001, Fall Technical Program, 160th, Cleveland, OH, United States, Oct. 16-20, 2001 (2001),

Using carbon-silica dual phase filler. Improve global compromise between rolling resistance, wear resistance and wet skid resistance for tires Wang, M.-J.; Kutsovsky, Y.; Zhang, P.; Mehos, G.; Murphy, L. J.; Mahmud, K.. Kautschuk Gummi Kunststoffe (2002), 55(1-2), 33-40.

New generation carbon-silica dual phase filler part I. Characterization and application to passenger tire. RuWang, Meng-Jiao; Kutsovsky, Yakov; Zhang, Ping; Murphy, Lawrence J.; Laube, Steven; Mahmud, Khaled. bber Chemistry and Technology (2002), 75(2), 247-263.

Carbon-silica dual phase filler application to passenger tread compounds. Zhang, Ping; Wang, Meng-Jiao; Kutsovsky, Yakov; Laube, Stephen; Mahmud, Khaled Rubber World (2002), 226(1), 43-51,54-55.

Simulation of flow through bead packs using the lattice Boltzmann method
Maier, R. S.; Kroll, D. M.; Kutsovsky, Y. E.; Davis, H. T.; Bernard, R. S. Physics of Fluids, Vol. 10, 1, 1998, pp.60-74

Pore-scale flow and transport calculations using the lattice Boltzmann method. Maier, R. S.; Kutsovsky, Y.; Nivarthi, S.; Davis, H. T.; Grunau, D. W.; Howington, S.; Bernard, R. S. Next Generation Environmental Models and Computational Methods, [Proceedings of the Next Generation Environmenal Models Computational Methods Workshop], Bay City, Mich., Aug. 7-9, 1995 (1997)

Paramagnetic Tracer Concentration Evolution by NMR Relaxation Time Mapping: Application to Aris-Taylor Dispersion - Longitudinal relaxation time Kutsovsky Y.E.; Alvarado V.; Scriven L.E.; Davis H.T.; Hammer B.E. Magnetic Resonance Imaging, Vol. 16, 1, 1998, pp. 63-71

Maier, R.S., Kutsovsky, Y.E., Nivarthi, S., Davis, H.T., Grunau, D.W., Howington, S., Bernard, R.S., 1996 Pore-Scale Flow and Transport Calculations Using the Lattice Boltzmann Method. In the Proceedings of US EPA Conference on Next Generation Environmental Modeling ed. G. Delic and M. Wheeler, SIAM, Philadelphia

Kutsovsky, Y.E., Hammer, B.E., Scriven, L.E., Davis, H.T. NMR Imaging of Velocity Profiles and Velocity Distributions in Bead Packs. Physics of Fluids, Volume 8, Issue 4, April 1996, pp.863-871

Kutsovsky, Y.E., Alvarado, V., Davis, H.T., Scriven, L.E., Hammer, B.E. 1995 Dispersion of Paramagnetic Tracers in Bead Packs by T1 Mapping: Experiments and Simulations. Magnetic Resonance Imaging, 14, Number 7, 1996, pp. 833-839 (7)

Kutsovsky, Y.E., Hammer, B.E., Scriven, L.E., Davis, H.T. 1995 Velocity Vector Imaging in a Single Sequence. In the Proceedings of the Conference of Society Of Magnetic Resonance, August 22-26, Nice, France, p.591

Kutsovsky, Y.E., Alvarado, V., Davis, H.T., Scriven, L.E., Hammer, B.E. 1995 Dispersion of Paramagnetic Tracers in Bead Packs by T1 Mapping: Experiments and Simulations. In the Proceedings of Third International Meeting "Recent Advances in MR Applications in Porous Media" September 3-6, Louvain-la-Neuve, Belgium, p. C7

Gavrilov, K., Kutsovsky, Y.E., Paukshtis, E.A., Okunev, A., Aristov, Y.I. 1994 Adsorption of Aliphatic Alcohols, Alkanoic Acids and Acetone on the Silica Surface: Chemical and Steric Factors of Monolayer Formation; Apparent Fractal Dimension. Mol. Cryst. Liq. Cryst., 248, 159-171

Kutsovsky, Y.E., Paukshtis, E.A., Aristov,Y.I. 1992 Abnormally High Fractal Dimension of Silica Surfaces Measured by Adsorption of Aliphatic Alcohols. React. Kinet. Catal. Lett. 46, No. 1, 57-64

Kutsovsky, Y. E., Kurshev, V.V, Aristov, Y.I., Raitsimring, A.M., Parmon, V.N. 1991 Fractal Nature of the Surface of Highly Dispersed MgO Using Electron Spin Echo. Translated from Doklady Akademii Nauk SSSR 316, No.5. 1147 - 1151.

Kutsovsky, Y. E., Aristov, Y. I., Parmon, V. N. 1989 Formal Kinetics of Electron Tunneling on the Fractal Surface. React. Kinet. Catal. Lett. 39, No. 2, 425 - 430.

Kutsovsky, Y. E., Mariasov, A. G., Aristov, Y. I., Parmon, V. N. 1990 Electron Spin Echo as a Tool for Investigation of Surface Structure of Finely Dispersed Fractal Solids. React. Kinet. Catal. Lett. 42, No.1, 19 -24.